## REMARKS

Claims 1, 3, 4, 6-15, 19 and 22-27 are now in the application. Claims 5 and 21 have been cancelled without prejudice or disclaimer. Claim 1 has been amended to include recitations along the lines of claims 5 and 21 to thereby recite that the inorganic microfine particle "is a silica having not less than 0.001 nor more than 2.0 of an integral intensity ratio $A_{Q3}/A_{Q4}$ obtainable by splitting a peak situated in the range of -120 to -80 ppm in $_{29}$Si-DD/MAS-NMR spectrometry into a $Q^3$ silica component and a $Q^4$ silica component and has no more than 3.0 cal/g of exotherm per unit mass thereof as observed in differential scanning calorimetry and/or differential thermal analysis in an air stream at 100°C to 400°C". Accordingly, claims 5 and 21 have been cancelled without prejudice or disclaimer. Newly presented claim 22 finds support on page 9, lines 17 to 25 of the specification. Newly presented claim 23 finds support on page 9, line 26 to page 11, line 24 of the specification. Newly presented claim 24 finds support on page 10, line 16 to page 11, line 24 of the specification. Newly presented claim 25 finds support on page 11, lines 23 to 24 and page 7, lines 21 to 25 of the specification. Newly presented claim 26 finds support on page 23, lines 26 to 35 of the specification. Newly presented claim 27 finds support on page 26, lines 21 to 30 of the specification.

The amendments to the claims and newly presented claim do not introduce any new matter. Claims 1, 3, 4, 6-15, 19 and 22-27 are deemed to be directed to the elected invention.

Claims 1, 3-7, 10-15, 19 and 21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 36 U.S.C. 103(a) as obvious over U.S. Patent 5,418,266 to Shiobara et al. or U.S. Patent 5,166,228 to Shiobara et al. These cited references fail to anticipate and fails to render obvious the present invention.

These cited references fail to teach or fairly suggest the fire resistant resin composition of the present invention. In Claim 1 as amended, the inorganic microfine particle is now recited to be a silica showing a specific integral intensity ratio $A_{Q3}/A_{Q4}$ and specific exotherm. The integral intensity ratio $A_{Q3}/A_{Q4}$ is derived from the amount of silanol groups existing in the silica. The exotherm is derived from the combustion of organic leaving groups such as alkoxyl, alkyl, phenyl, phenoxyl, and amino groups present on the surface and/or interiorly of the silica, and affect the fire retardancy-imparting ability of the silica for the resin composition. Please see

page 41, line 23 to page 42, line 7 of the specification.

A silica such that the exotherm is not more than 3.0 cal/g and the integral intensity ratio $A_{Q3}/A_{Q4}$ is not less than 0.001 nor more than 2.0 has an abundance of silanol groups and few organic groups other than silanol groups in the silica. Therefore, such silica has a very favorable fire retardancy-imparting ability for resins, as disclosed on page 42, lines 8 to 13 and page 5, line 8 to page 6, line 5 of the specification.

That is, the parameters of the integral intensity ratio $A_{Q3}/A_{Q4}$ and exotherm significantly relate to the structure or condition of the silica, and these properties can determine whether a silica has a satisfactory fire retardancy-imparting ability or not.

For example, fused silica that does not have the peak of $A_{Q3}$ as shown in Fig.3 and the integral intensity ratio $A_{Q3}/A_{Q4}$ of the fused silica is invariably 0, as described in page 68, lines 17 to 20 and Comparative Example 9 on Table 5 of the specification. That suggests the complete absence of silanol groups in the silicas. In addition, "Polyphenol composition L" in Comparative Example 9 is produced in Production Example 6, wherein commercial fused silica is used.

Further, even if products are produced by hydrolysis and condensation of an alkoxide compound and/or a carboxylic acid salt compound, which are used as the inorganic microfine particle of the present invention, the products do not necessarily or inherently have the above-mentioned characteristics of the integral intensity ratio $A_{Q3}/A_{Q4}$ and/or exotherm. Please see Comparative Examples 7 and 8 on Table 5 of the specification. The compositions of Comparative Examples 7 and 8, respectively, contain "Polyphenol composition J" and "Polyphenol composition K".

"Polyphenol composition J" contains silica produced by the method containing a step of baking at high temperature (600 °C), as described in Production Example 4. "Polyphenol composition K" contains silica produced by hydrolysis of tetramethoxysilane, but the amount of water used is too small, as described in Production Example 5.

In Comparative Example 7, $A_{Q3}/A_{Q4}$ is invariably 0 and the exothermic peak between 100°C and 400°C is minimal, suggesting the complete absence of silanol groups in the silica. In Comparative Example 8, $A_{Q3}/A_{Q4}$ is comparatively large and the exothermic peak between 100°C and 400°C is also large, suggesting the presence of an abundance of combustible organic

groups other than silanol in the silica.

As shown in Comparative Examples 7, 8 and 9 on Table 5, when these silicas are used in place of the inorganic microfine particle of the present invention, the fire retardancy was not achieved to the grade V-0.

Contrary to this, the UL-94 fire retardancy of V-0 is expressed in Examples 27 to 29, wherein the inorganic microfine particles of the present invention are used.

In addition, the desirable production method of such inorganic microfine particles having the specific integral intensity ratio $A_{Q3}/A_{Q4}$ and specific exotherm is described on page 42, lines 14 to 21 of the specification.

U.S. Patent 5,418,266 teaches that "fused silica is preferred" on column 9, line 20, and the three species of fused silica are only used as Component (C), which is an inorganic filler, in Examples as described on column 10, lines 39 to 54.

As mentioned above, fused silica does not have the peak of $A_{Q3}$ and its integral intensity ratio $A_{Q3}/A_{Q4}$ is invariably 0, and therefore, the composition in U.S. Patent 5,418,266 differs from the fire retardant resin composition of the present invention.

Further, as in the above-mentioned Comparative Example 9, the composition containing such fused silica is inferior in fire retardancy as compared to the fire retardant resin composition of the present invention.

Similarly, in U.S. Patent 5,166,228, the three species of fused silica are only used as Quartz Powders in Examples as described on column 10, lines 31 to 41.

Therefore, the composition in U.S. Patent 5,166,228 also differs from the fire retardant resin composition of the present invention and is inferior to that of the present invention in fire retardancy.

The above cited references fail to anticipate the present invention. In particular, anticipation requires the disclosure, in a prior art reference, of each and every recitation as set forth in the claims. *See Titanium Metals Corp. v. Banner*, 227 USPQ 773 (Fed. Cir. 1985), *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 1 USPQ2d 1081 (Fed. Cir. 1986), and *Akzo N.V. v. U.S. International Trade Commissioner*, 1 USPQ2d 1241 (Fed. Cir. 1986).

There must be no difference between the claimed invention and reference disclosure for an anticipation rejection under 35 U.S.C. 102. *See Scripps Clinic and Research Foundation v.*

*Genetech, Inc.*, 18 USPQ2d 1001 (CAFC 1991) and *Studiengesellschaft Kohle GmbH v. Dart Industries*, 220 USPQ 841 (CAFC 1984).

To the extent, inherency is being relied upon in the Office Action, the law is well settled that claiming of a more specific range within a more generic range and/or claiming species from a broader group of possible compounds avoids a lack of novelty rejection. The test for anticipation is whether the claims read on the prior art disclosure, not on what the references broadly teach.

For example, see *Akzo N.V. v. U.S. International Trade Commissioner* 1 USPQ2d 1241 (Fed. Cir. 1986). In Akzo, claims that were drawn to a process for making aramid fibers using a 98% sulfuric acid were not anticipated by a reference using a concentrated sulfuric acid solution but which did not specifically disclose that it was a 98% concentrated sulfuric acid solution. The disclosure of a concentrated sulfuric acid was not deemed an inherent disclosure of the more specific 98% sulfuric acid.

The court further found that no anticipation exists when one would have had to "randomly pick and choose among a number of different polyamides, a plurality of solvents and a range of inherent viscosities" to reach the claimed invention.

Also see *In re* Kollman et al. 201 USPQ 193 (CCPA-1979) wherein the court held that the prior art generic disclosure contains "no suggestion of the required FENAC/diphenyl ether ratio".

An invention can not be rejected based on "inherency" because of probability or possibility of the presence of the constitution in the prior art. Please see *Crown Operations International Ltd. v. Solutia* 24 USPQ 2d 1917 (Fed. Cir. 2002).

Claims 1, 3-15, 19 and 21 are rejected under35 U.S.C. 103(a) as being obvious over U.S. Patent 5,834,551 to Haraguchi et al (hereinafter also referred to as "Haraguchi") in view of either U.S. Patent 5,418,266 to Shiobara et al. or U.S. Patent 5,166,228 to Shiobara et al. The cited references do not render obvious the present invention.

In Claim 1 as now amended, the inorganic microfine particle is now recited to be a specific silica in order to achieve satisfactory fire retardancy-imparting ability. And, as mentioned above, both U.S. Patent 5,418,266 and U.S. Patent 5,166,228 fail to teach or fairly suggest such inorganic microfine particle.

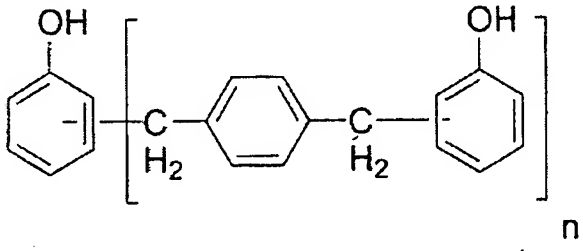
Further, U.S. Patent 5,834,551 (Haraguchi) fails to teach or fairly suggest the fire retardancy-imparting ability.

Therefore, it would not be obvious to one having ordinary skill in the art to use the disclosure of U.S. Patent 5,834,551 (Haraguchi) in the compositions of U.S. Patent 5,418,266 or U.S. Patent 5,166,228, in order to achieve satisfactory fire retardancy-imparting ability.

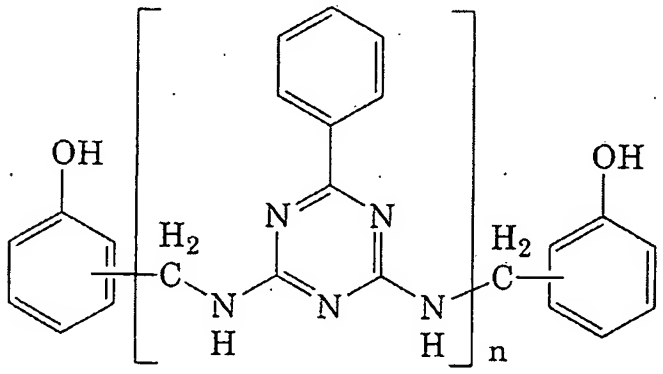
In addition, the fire retardant resin composition of the present invention achieves the remarkable advantage of the fire retardancy as mentioned above. This advantage is by no means expected, and in fact, is unexpected.

With respect to the comments in the Office Action concerning the Declaration under 37 CFR 1.132, previously filed, shown below are the chemical structures of the polyphenol resin used and/or made in Examples and Declaration:

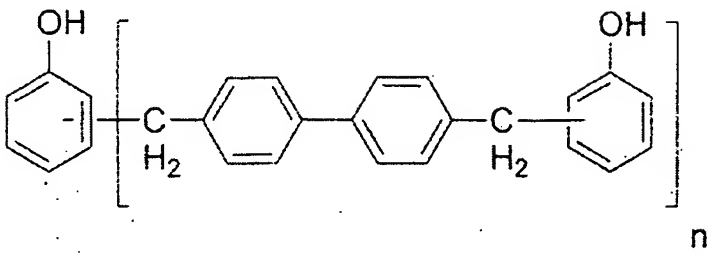
Ex.1 (Composition A), Comparative Ex.1 (Composition G)



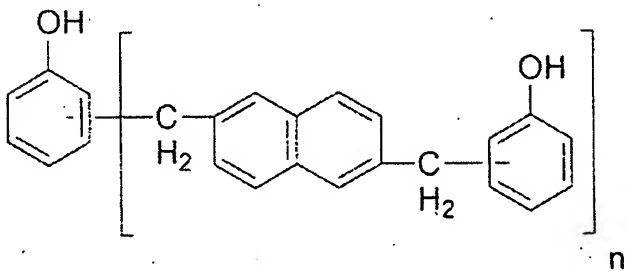

Ex.2 (Composition B), Comparative Ex.2 (Composition H)
Production Ex.5 (Composition K)



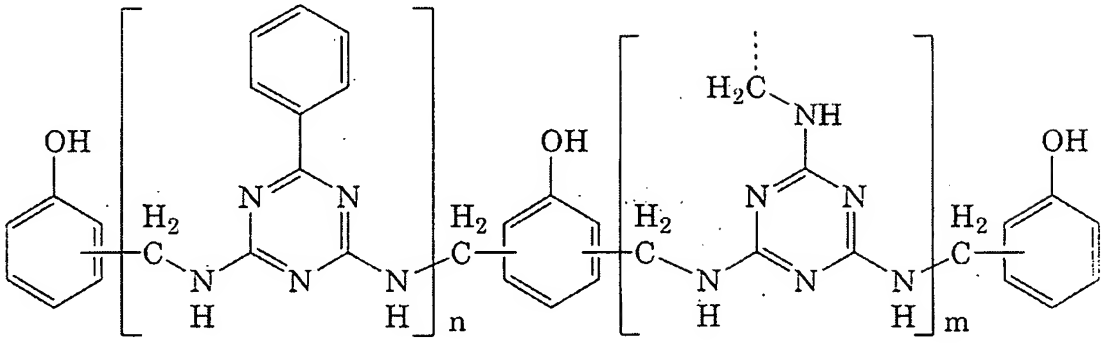
Ex.3 (Composition C)



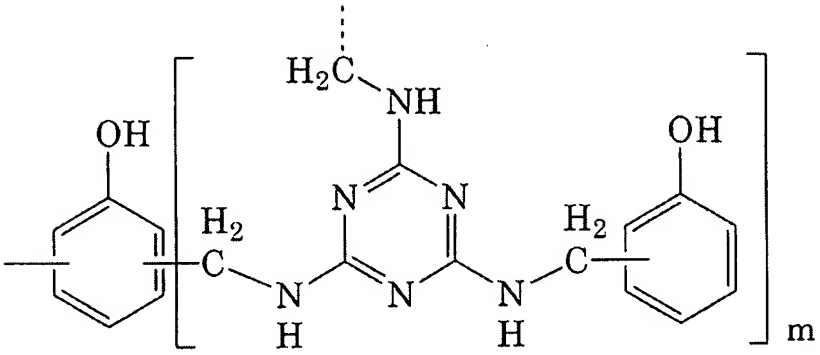
Ex.4 (Composition D)



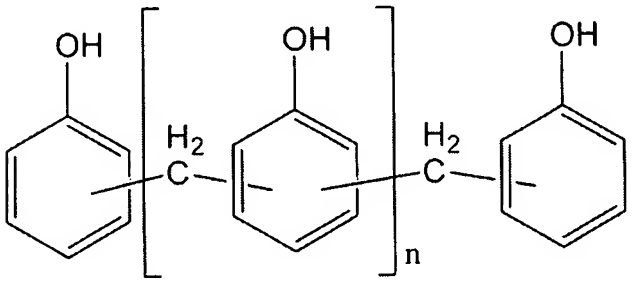
Ex.5 (Composition E), Ex.6 (composition F)



Composition I, J, L (melamine-phenol resin, product name "Epicure YLH969", product of Japan Epoxy Resins Co., Ltd.)



Additional Comparative Example (Polyphenol Z)



As mentioned above, "Polyphenol Z" has a structure where aromatic units having phenolic hydroxyl groups are connected to one another through a methylene group (-$CH_2$-).

In contrast, the polyphenol compounds of the present invention have "such a structure that aromatic units each having at least one phenolic hydroxyl groups are connected to one another through an organic unit containing two or more carbon atoms, wherein said organic unit containing two or more carbon atoms has a cyclic structure" as recited in claim 1.

The above-mentioned polyphenol compound in Ex.1 corresponds to the compound having a xylylene moiety, and the above-mentioned polyphenol compound in Ex.3 corresponds to the compound having a biphenylene moiety, and these compound are included in "(1) aromatic compounds having any of α-hydroxyalkyl, α-alkoxyalkyl and α-acetoxyalkyl groups" in the new claim 22, as mentioned above. Similarly, the above-mentioned polyphenol compound in Ex.4 is included in the aromatic compounds (1).

The above-mentioned polyphenol compounds in Ex.2 and Ex.5-6 correspond to the

compounds having a triazine moiety, which are included in "(5) compounds having any of amino, hydroxyalkylamino, and di(hydroxyalkyl)amino groups" in the claim 22, as mentioned above.

Haraguchi et al. suggest a composite of a thermosetting resin with a metallic oxide, which is obtained by using a phenolic resin. However, the phenolic resin described in Haraguchi et al differs structurally from the polyphenol compound described in the present.

It is common knowledge to those skilled in the art that "a phenolic resin" usually consists of such a structure where aromatic units having phenolic hydroxyl groups are connected to one another through a methylene group containing one carbon atom, as mentioned on page 2, lines 21 to 24 of the present disclosure. In contrast, the polyphenol compound according to the present invention has a structure where aromatic units each having at least one phenolic hydroxyl group are connected to one another through an organic unit containing two or more carbon atoms.

The cited art lacks the necessary direction or incentive to those or ordinary skill in the art to render a rejection under 35 USC 103 sustainable. The cited art fails to provide the degree of predictability of success of achieving the properties attainable by the present invention, as evidenced by the Declaration filed with the prior response, needed to sustain a rejection under 35 USC 103. See *KSR Int'l Co. v. Teleflex, Inc*, supra, *Diversitech Corp. v. Century Steps, Inc.* 7 USPQ2d 1315 (Fed. Cir. 1988), *In re Mercier*, 187 USPQ 774 (CCPA 1975) and *In re Naylor*, 152 USPQ 106 (CCPA 1966).

Moreover, the properties of the subject matter and improvements which are inherent in the claimed subject matter and/or disclosed in the specification are to be considered when evaluating the question of obviousness under 35 USC 103. See *KSR Int'l Co. v. Teleflex, Inc*, supra; *Gillette Co. v. S.C. Johnson & Son, Inc.*, 16 USPQ2d. 1923 (Fed. Cir. 1990), *In re Antonie*, 195 USPQ 6 (CCPA 1977), *In re Estes*, 164 USPQ 519 (CCPA 1970), and *In re Papesch*, 137 USPQ 43 (CCPA 1963).

No property can be ignored in determining patentability and comparing the claimed invention to the cited art. Along these lines, see *In re Papesch*, supra, *In re Burt et al*, 148 USPQ 548 (CCPA 1966), *In re Ward*, 141 USPQ 227 (CCPA 1964), and *In re Cescon*, 177 USPQ 264 (CCPA 1973).

In view of the above, consideration and allowance are, therefore, respectfully solicited.

In the event that the Examiner believes that an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

Please charge any necessary fees or credit any overpayment to Deposit Account 22-0185, under Order No. 21581-00334-US1.

Respectfully submitted,

Dated: January 29, 2009

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